

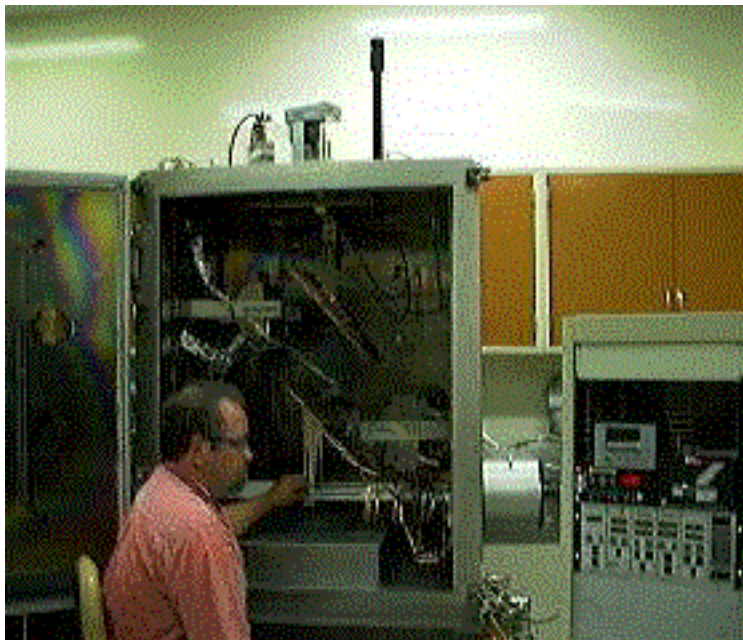
Physical Vapor Deposition

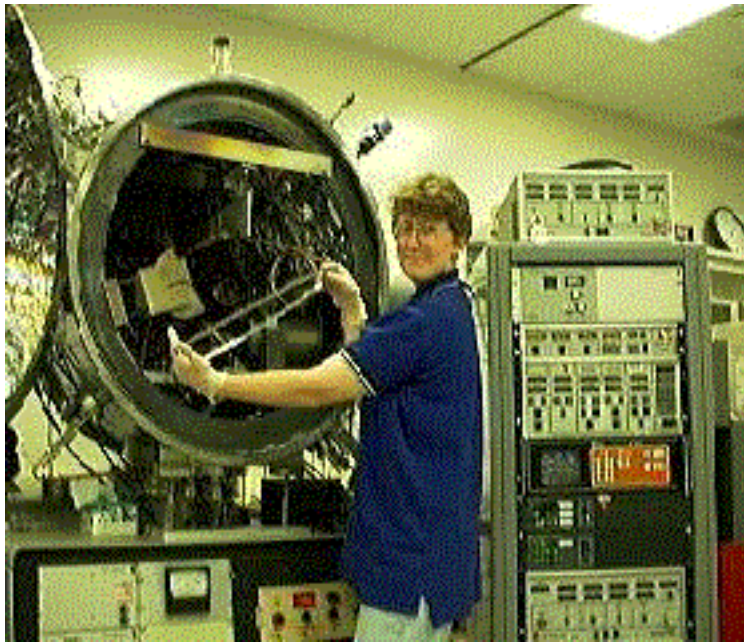
What we do:

The functional capabilities of the PVD Team include most of the typical physical vapor deposition processes, such as electron-beam evaporation and RF & DC sputtering deposition. In addition, the team has other PVD activities involving ion-beam sputtering, ion-assisted, ion-beam sputtering, and ion-assisted, electron-beam deposition. The electroplating area in MST-7 also belongs to the PVD Team. Along with these coating activities, the PVD team also has capabilities in UHV, ion-beam milling, analytical microscopy and surface science. Our analytical capabilities include Auger, ESCA, EDAX, SEM, TEM, LEED, SIMS, and AFM. In PVD, we bring these tools to bear on materials problems of interest to laboratory programs, which includes interactions with industry, through CRADAs, Weapons Support Agreements (WSAs), etc.

Some of our current projects:

- The Flow-through ion gun to generate oriented coating layers for diffracting x-rays in Equation of State experiments is a LANL invention by Robert Springer.
- Mercury-Less Fluorescent Lighting technology is presently being researched by Marion Scott and Tom Moss.
- High Temperature Superconducting tapes, utilizing near crystalline template layers deposited by ion-assisted, ion beam sputtering are being developed in partnership with American Superconductors, Inc and also with 3M Corporation.
- (Below) Ray DePaula and Jennifer Roper operate ion-beam sputtering chambers for this CRADA.





- (Below) Thermal Barrier Coatings are being developed jointly for the LANL weapons program and as part of a CRADA to improve Pratt & Whitney turbine blades in aircraft engines.



- (Below) Harry Dilello deposits alpha barrier coatings for the NMSM Pit Rebuild Program by electron-beam evaporation



- (Below) John Townsend examines thickness calibration on the DecTak profilometer for the NMT-9 Diffusion Barrier Coatings to be used for plutonium oxide fire-protection capsules.



- (Below) Flyer-plate and slapper detonator coatings are deposited by Ron Snow for DX Divison.



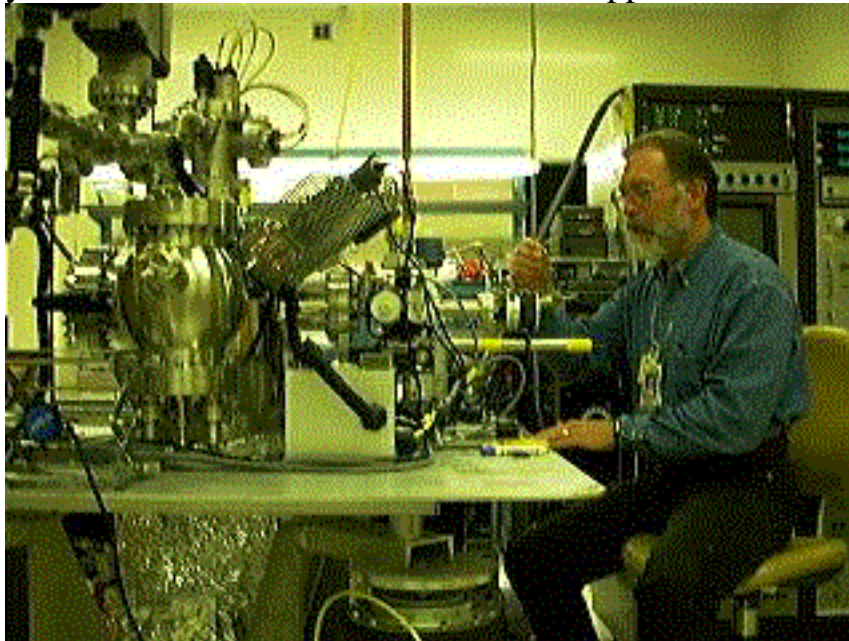
- (Below) Inertial Confinement Fusion (ICF) target fabrication, includes beryllium coatings (Bobbie Henneke) and electroforming (Mike Brooks).



- (Below) TEM is used, by Chris Adams, to examine waveguide, optical-amplifier coatings in a CRADA with AT&T.



- (Below) UHV, precision ion-milling equipment, being adjusted by Bruce Lamartine, can be used to create nanometer to micrometer features for the ICF program or can be used to store High Density ROM information for a commercial application.



- (Below) An integrating sphere and calibrated lamp, being adjusted by Marion Scott, will be used to evaluate the efficiency of a new diamond lamp for the DOE.



- (Below) Equation of state measurements for materials, which will eventually include plutonium, will be made possible with oriented films being examined with AFM by Bob Springer.



- (Below) Wally Anderson is showing a photo from an HEDP (high energy density physics) experiment.



For more information, contact Los Alamos' Transportation Program:

Program Manager: Larry Blair

Phone: 505-667-1936

Fax: 505-665-2964

E-mail: lblair@lanl.gov

Program Development: Linda Rowton

Phone: 505-665-3322

Fax: 505-665-2964

E-mail: lrowton@lanl.gov



